

# **Wildland Fire Mitigation and Management Commission**

## **Aerial Equipment Strategy Report**



January 2023

# Background

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In 2021, the Infrastructure Investment and Jobs Act (IIJA) created the federal Wildland Fire Mitigation and Management Commission. The Commission was charged with making recommendations to improve federal policies related to the prevention, mitigation, suppression, and management of wildland fires in the United States, and the rehabilitation of land in the United States devastated by wildland fires. The Commission was deliberately established as a nonpartisan body with 50 members, including representatives from federal agencies; state, local, and Tribal governments; nongovernmental entities; academia; and the private sector. As part of its work, the Commission was tasked with developing two reports to Congress: the report that follows, which outlines a strategy to meet aerial firefighting equipment needs through 2030, and another report scheduled for release in September 2023 that delivers a much more comprehensive set of recommendations to address the nation’s wildfire crisis.

For more information, visit: [usda.gov/topics/disaster-resource-center/wildland-fire/commission](https://usda.gov/topics/disaster-resource-center/wildland-fire/commission)

# Commission Members

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## **Jamiah Adams**

Senior Vice President of Diversity and Justice, The Climate Reality Project, CA  
*Health Equity*

## **Lucinda Andreani**

Deputy County Manager, Coconino County, AZ  
*County Government Representative*

## **Kimiko Barrett, PhD**

Senior Wildfire Researcher and Policy Analyst, Headwaters Economics, MT  
*Science (social and ecological)*

## **Ann Bartuska, PhD**

Senior Contributing Scientist, Environmental Defense Fund, Washington DC  
Senior Advisor, Resources for the Future, Washington DC  
*Innovation (alternate)*

## **Johnna Blackhair**

Deputy Director, Bureau of Indian Affairs  
*Federal Member*

## **Neil Chapman**

Forest Health Supervisor, City of Flagstaff, AZ  
*Municipal Government Representative (alternate)*

## **Joannie Chin**

Director, Engineering Laboratory, National Institute of Standards and Technology  
*Federal Member*

## **Sam Cook**

Executive Director of Forest Assets, College of Natural Resources, NC State University, NC  
Vice President, Natural Resources Foundation, NC State University, NC  
*Forest Stewardship and Reforestation*

## **Tim Cook**

Washington State Hazard Mitigation Officer, WA  
*State Hazard Mitigation (alternate)*

## **William (Bill) Cox**

Rich County Commissioner, UT  
*County Government Representative (alternate)*

**Deanne Criswell**

Administrator, Federal Emergency Management Agency  
*Co-Chair*

**Cody Desautel**

Executive Director, Confederated Tribes of the Colville Reservation, WA  
*Forestry/Industry Representative*

**Andy Fecko**

General Manager, Placer County Water Agency, CA  
*Public Utilities Industry (alternate)*

**Jennifer Flynn**

Associate Director of Visitor and Resource Protection, National Park Service  
*Federal Member*

**David Fogerson**

Nevada Emergency Manager and Homeland Security Chief, NV  
*State Department of Energy or similar State agency (alternate)*

**Dan Gibbs**

Executive Director, Colorado Department of Natural Resources, CO  
*State Department of Natural Resources, Forestry or Agriculture, or similar State agency (alternate)*

**Angela Gladwell**

Director, Hazard Mitigation Assistance, Mitigation Framework Leadership Group, Federal Emergency Management Agency  
*Federal Member*

**Deb Haaland**

Secretary of the Interior  
*Co-Chair*

**Jaelith Hall-Rivera**

Deputy Chief, State, Private and Tribal Forestry, U.S. Forest Service  
*Federal Member*

**Meryl Harrell**

Deputy Under Secretary for Natural Resources and Environment, U.S. Department of Agriculture  
*Co-Chair Designee*

**Robyn Heffernan**

National Fire Weather Science and Dissemination Meteorologist, National Oceanic and Atmospheric Administration  
*Federal Member*

**Kathy Holder**

Utah State Hazard Mitigation Officer, UT  
*State Hazard Mitigation*

**Jim Hubbard**

Under Secretary for National Resources and Environment, U.S. Department of Agriculture  
Deputy Chief (retired), U.S. Forest Service, CO  
*National Wildland Fire Cohesive Strategy*

**Gary Jackson**

Tribal Vice-Chairman, Cow Creek Band of Umpqua Tribe of Indians, OR  
*Tribal Government Representative (alternate)*

**Kacey KC**

Nevada State Forester, Nevada Division of Forestry, NV  
President, National Association of State Foresters, NV  
*State Department of Natural Resources, Forestry or Agriculture, or similar State agency*

**Elizabeth (Eli) King**

Washington State Energy Emergency Management Director, WA  
*State Department of Energy or similar State agency*

**Brian Kittler**

Vice President of Forest Restoration, American Forests, OR  
*Forest Stewardship and Reforestation (alternate)*

**Kelly Martin**

President, Grassroots Wildland Firefighters, ID  
*Wildland Firefighter*

**Cynthia Martinez**

Chief, National Wildlife Refuge System, U.S. Fish and Wildlife Service  
*Federal Member*

**Shane McDonald**

Executive Board Chair, National Wildfire Coordinating Group  
*Federal Member*

**Madelene McDonald**

Senior Watershed Scientist, Denver Water, CO  
*Public Utilities Industry*

**Kathleen (Kat) McIntyre, PhD**

Forest Health Program Manager, Tahoe Regional Planning Agency, CA  
*Municipal Government Representative*

**Nathan Miller**

Wildland Superintendent, City of Santa Fe Fire Department, NM  
*Wildland Firefighter (alternate)*

**Scott Miller**

Senior Regional Director for the Southwest Region, The Wilderness Society, CO  
*501(c)3 organization with expertise in forest management and environmental conservation (alternate)*

**Ana Montero**

Director, Public Assistance Division, Recovery Support Function Leadership Group, Federal Emergency Management Agency  
*Federal Member*

**Joan Mooney**

Principal Deputy Assistant Secretary for Policy, Management and Budget, U.S. Department of the Interior  
*Co-Chair Designee*

**Lori Moore-Merrell, DrPH**

Administrator, U.S. Fire Administration, U.S. Department of Homeland Security  
*Co-Chair Designee*

**Mike Morgan**

Division Director, Colorado Division of Fire Prevention and Control, CO  
*State Fire Response (alternate)*

**Jessica Morse**

Deputy Secretary for Forest and Wildland Resilience, California Natural Resources Agency, CA  
*Innovation*

**Kari Nadeau, MD, PhD**

John Rock Professor of Climate and Population Studies and Chair of the Department of Environmental Health, Harvard T.H. Chan School of Public Health, MA  
*Health Equity (alternate)*

**Mike Nedd**

Deputy Director of Operations, Bureau of Land Management  
*Federal Member*

**John O’Keeffe**

Rancher, OR  
Past President, Oregon Cattlemen’s Association, OR  
*Forestry/Industry Representative (alternate)*

**Bob Roper**

Senior Policy Advisor, Western Fire Chiefs Association, CA  
*National Wildland Fire Cohesive Strategy (alternate)*

**Mariana Ruiz-Temple**

Fire Marshal, Oregon State, OR  
*State Fire Response*

**David A. Sampson**

President and CEO, American Property Casualty Insurance Association, TX  
*Property Development Industry*

**Erika Sasser**

Director of Health and Environmental Impacts, Office of Air and Radiation, Environmental Protection Agency  
*Federal Member*

**Marek Smith**

North America Fire Director, The Nature Conservancy, NC  
*501(c)3 organization with expertise in forest management and environmental conservation*

**Michele Steinberg**

Wildfire Division Director, National Fire Protection Association, MA  
*Property Development Industry (alternate)*

**Scott Stephens, PhD**

Professor of Fire Science, University of California Berkeley, CA  
*Science (social and ecological) (alternate)*

**Craig Thomas**

Director, The Fire Restoration Group, CA  
*Prescribed Fire (alternate)*

**Bill Tripp**

Director of Natural Resources and Environmental Policy, Karuk Tribe, CA  
*Tribal Government Representative*

**Thomas Vilsack**

Secretary of Agriculture  
*Co-Chair*

**John Weir**

Associate Extension Specialist, Natural Resource Ecology and Management, Oklahoma State University, OK  
*Prescribed Fire*

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# Report Summary

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In 2021, the Infrastructure Investment and Jobs Act (IIJA) (Pub.L. 117-58) created the federal Wildland Fire Mitigation and Management Commission (the Commission) to make recommendations to improve federal policies related to the prevention, mitigation, suppression, and management of wildland fires in the United States and the rehabilitation of land in the United States devastated by wildland fires. Among its charges, the legislation tasked the Commission with developing a strategy for meeting aerial equipment needs through the year 2030. The Commission took on this task as an opportunity to look expansively at the nation's resources and strategies for wildland fire aviation, and produced the following recommendations that attempt to set aviation management on a new trajectory for the next decade and beyond.

In developing these recommendations, the Commission also sought to address several key themes: the need to develop an overarching, forward-looking aviation strategy that drives procurement, rather than letting aviation approaches become constrained by current practices; the need to invest in both technology and people to build an aviation fleet that meets long-term demand; and the need to take an inclusive approach to the range of functions aerial resources can serve and the range of entities that must be included in development of a truly national – rather than federal – aviation strategy.

## Executive Summary

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Wildland fire aviation resources have been a part of wildfire prevention, mitigation, and response strategies in the United States for at least the past six decades (Government Accountability Office [GAO], 2013). While aerial resources are just one of many tools used to support management objectives, aircraft have become a high-profile, widely recognized symbol of the nation's response to wildfire. Across the country, fire has long played a key ecological role in natural systems, through natural ignitions and the use of fire by Indigenous people. More recent human influence has substantially altered our relationship to fire, however, leading to greater risks. As wildfire seasons increase in duration and intensity, and as the need for proactive risk reduction treatments increases, there is a compelling need to reexamine existing approaches to aviation fleet procurement, use, composition, and quantity.

Aerial assets bring unique capabilities to wildland fire planning, management, support, suppression, and mitigation, and there are opportunities to expand those

capabilities. Aviation resources fulfill a range of functions that complement ground-based forces including dropping retardant or water to help contain wildland fires; deploying firefighters to a fire; supporting ground crew operations; and providing reconnaissance of new fires, fire locations, and fire behavior. However, these resources also come with significant risks and are a costly component of wildland fire management (Calkin 2014; National Interagency Aviation Committee [NIAC], 2017). Further, aerial resource management and coordination is complex, involving multiple agencies operating at multiple governmental levels, each with their own programs, authorities, equipment, and scopes of work (NIAC, 2017; National Interagency Fire Center [NIFC], 2022). At present, the federal wildland fire community has significant strategy and doctrine to support the execution of the aviation mission, though decisions regarding aviation equipment and fleet composition appear to be iterative, based on anticipated seasonal wildfire severity, and guided by expert opinion and experience.

In light of the complexities, capabilities, and costs associated with aviation resource use and management, there have been numerous efforts to better understand resource needs and effectiveness, and to develop a comprehensive strategy for the nation's aerial fleet. However, reviews of these efforts found that they generally made only limited progress due in large part to insufficient information and limited inter-agency collaboration (Booz Allen Hamilton, 2015; GAO, 2013). Strategic planning and assessment initiatives that have taken place since those reviews have faced similar hurdles. A 2017 draft interagency strategy for wildland fire aviation resources has yet to be finalized due in part to a lack of aviation performance data (NIAC, 2017). A parallel effort, initiated in 2012 by the U.S. Department of Agriculture (USDA), intended to document aircraft use and effectiveness (USDA, 2020). In all, that study required eight years to complete but fell short of comprehensively assessing the performance of all aircraft types and functions during wildland fire response. The years-long timelines and hurdles faced by these recent efforts further underscore the difficulty of the questions they seek to answer. In spite of these challenges, the need to strategically evaluate and utilize the nation's aerial firefighting fleet remains crucial to address.

The task of addressing aerial resource strategy was explicitly assigned to the Commission in the 2021 infrastructure law. As part of its work to develop a range of recommendations to address the nation's wildfire crisis, the Commission was charged with creating a strategy to meet aerial firefighting equipment needs through 2030 in a manner that is cost-effective and based on assessments of aviation equipment needs and surplus inventory. The Commission was given 90 days to complete this work after receipt of a list of surplus aircraft provided by federal agencies.

In addition to the aerial equipment strategy report, the Commission was tasked with producing a report and recommendations that more comprehensively addresses wildland fire prevention, mitigation, suppression, and management,

and post-fire rehabilitation. The Commission was given one year to produce that more extensive report, and it is slated for completion in September 2023.

The Commission itself was deliberately established as a nonpartisan body with 50 members, including representatives from federal agencies; state, local, and Tribal governments; nongovernmental entities; academia; and the private sector. In addition to these official affiliations, Commission members represent a multitude of interests, lived experiences, geographical contexts, and communities of practice. Members also possess a broad range of expertise with wildfire, including expertise related to operational firefighting, prescribed fire, watershed restoration, pre-fire mitigation, research, public health, and more. Through this membership, the Commission brings together a rare diversity of backgrounds, experiences, and expertise to undertake what many in this space have long advocated: a collaborative and cross-cutting approach to wildfire mitigation and management.

The Commission began its work in September 2022, undertaking the aviation strategy from the outset in order to meet the requirements specified in the IJJA. Over the course of its work, the Commission consulted previous strategies, assessments, and peer-reviewed articles on aviation response; reviewed data sources on aviation resource use and availability; and met with a range of subject matter experts from state and federal agencies and the private aviation contracting industry. Individual Commission members also brought their own personal expertise and experience to the group's discussions and deliberations. The Commission's work yielded a number of findings and recommendations, detailed below. The recommendations were approved by the full Commission in January 2023.

The recommendations put forth in this report reflect the Commission's intent to chart a course forward for an aerial asset equipment strategy that supports the resources and interagency coordination needed to match the evolving scale and needs of wildland fire mitigation and management. While the statutory charge of the Commission included looking out to the year 2030, many of the recommendations intend to address issues likely to be important well beyond the next decade. Concepts like greater cooperation and coordination between the various parties that make up the national wildland fire aviation community is a critical and perennial goal, and worth keeping as a guiding principle well past 2030. The Commission also acknowledges the extensive effort that has already been invested in evaluating and informing strategic use of aviation resources. It was the Commission's intent to produce work that is additive to those efforts.

The following recommendations and findings address multiple broad themes, including development of new strategic frameworks, improvements to the existing management of aviation resources, and a review of and recommendations on the current use of and interest in military surplus in the wildland fire environment. More specifically, findings and recommendations address the need for the

development of new or updated aviation resource benchmarks and national procurement models and the need for greater coordination with partners in those efforts; improvements to appropriations, contracting, staffing, and military interoperability to improve the use and availability of new and existing resources; improvements and limitations to the military surplus process and equipment; and additional considerations, including aviation resource use in beneficial fire and the emerging importance of Uncrewed Aerial Systems (UAS) – also known as “drones.”

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While these findings and recommendations are valuable and actionable, given the timeline required by the IIJA and the resources available to the Commission, this report faced many of the same difficulties as preceding efforts in this space. Some recommendations are specific, actionable, and short term, though others are by necessity broader, long-term goals. Furthermore, the Wildland Fire Mitigation and Management Commission Aerial Equipment Strategy Report is a specific task within the Commission's broader charge and additional recommendations regarding aviation management may be included in the full Commission report scheduled to be finalized by mid-September 2023.

# Charge of the Commission

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The Infrastructure Investments and Jobs Act (IIJA) contained two charges related to aviation: The Secretary of Defense and the heads of other relevant agencies were directed to produce an inventory of surplus cargo and passenger aircraft and aircraft parts that would be available and usable for wildland firefighting, and the Commission was directed to develop a report outlining a strategy to meet aerial firefighting equipment needs through 2030 in the most cost-effective manner.<sup>1</sup>

While the Commission sought to facilitate the creation of the inventory, the primary task of this group was to produce the strategy report. The Commission was given 90 days to complete this report after receipt of the list of surplus aircraft and parts from federal agencies. Statute specified that the report was to provide:

- An assessment of the expected number of aircraft and aircraft parts needed to fight wildland fires through 2030;
- An assessment of surplus transfer authorities and current use;
- Recommendations to ensure the availability of aircraft and aircraft parts that the Commission expects will be necessary to fight wildland fires through 2030 in the most cost-effective manner.

Over the course of its work, the Commission consulted previous strategies, assessments, and peer-reviewed articles that provided an overview of the aviation sector and important efforts to date. Those documents included, but were not limited to, the most recent aviation strategic plan developed by the National Interagency Aviation Committee (NIAC), the 2020 Aerial Firefighting Use and Effectiveness (AFUE) Report developed by the U.S. Department of Agriculture (USDA), and the U.S. Forest Service 2020 Annual Aviation Report.

The Commission also obtained data reports directly from agencies, including summaries of current inventories of contracted and agency-owned aviation resources and data on “Canceled, Unable to Fill” (UTF) requests for aircraft and associated personnel.<sup>2</sup> UTF data reflects the number of instances when equipment or personnel requested by incidents cannot be provided, either because the equipment itself is not available or because the associated manager is unavailable. The Commission found that these data sources had varying utility. UTF data in particular has several well-recognized limitations that reduced its utility for the Commission’s work (See: “Unable-to-Fill” Data breakout box).

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<sup>1</sup> The full text of the statute is available in Appendix A

<sup>2</sup> Data reports produced for and reviewed by the Commission will be released in supplemental materials to follow.



### **“Unable to Fill” Data**

During the course of its work, the Commission examined the last four years of data (2018-2022) for “Canceled, Unable to Fill,” commonly referred to as “UTF” requests for aircraft and aviation-related personnel. Agencies have come to rely on UTF data as the de-facto standard for reporting unmet resource demand (Belval et al., 2020). However, the Commission learned that several features of this data reduce its utility for accurately capturing resource scarcity and informing the development of a long-term aviation strategy. Those limitations include:

Over- and under-requesting based on individual incident commanders’ judgment and behavior (some managers may not ask for all the resources they need if it is unlikely their requests will be met while others may request resources anyway, and continue to request alternative resources until they feel their needs have been satisfied). Given this influence of human behavior, the data may not accurately capture the true level of resource demand (Belval et al., 2020)

Difficulties determining the total number of requests for a given resource given inconsistencies between records systems. This shortfall prevents a calculation of UTFs as a proportion of the total number of requests for a given resource, which would indicate what percentage of time resources were unavailable when managers requested them (Belval et al., 2020).

The fundamental nature of UTF data, which reflects the current management paradigm and localized resource requests but cannot help answer questions of cost effectiveness, strategic or enterprise level need, or future need.

In addition to the aforementioned data and report review, Commission members consulted with a range of subject matter experts (SMEs) who represented the perspectives of state and federal wildland firefighting agencies and the private aviation contracting industry. Many of those SMEs were associated with interagency bodies such as the NIAC or, in the case of private industry experts, were nominated by leaders in the contract aviation community to offer a broad perspective to the Commission. SMEs were able to offer their own perspectives, answer direct questions, and were available for fact checking and discussion of the implications of potential recommendations. Commission members also brought ample expertise on this topic, both through direct interface with aerial resources and through information gleaned from others in their organizations,

communities, and networks. Finally, the Commission allowed for members of the public to submit recommendations proposals through a comment portal, offering yet another opportunity for including external opinions and perspectives.

The Commission undertook regular discussions and deliberations, with the goal of producing consensus recommendations that would meet the charge put forth by Congress.

## Previous Aerial Review and Strategy Efforts

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Over the past six decades, federal agencies have produced numerous studies, reviews, and strategy documents related to firefighting aviation needs and operations. The Commission reviewed past studies to avoid duplication of efforts and build on existing knowledge. Broadly, past efforts have focused on greater cooperation between federal agencies; calls for improved measures of the efficacy of aerial resources; and the need for the development of strategic assessments and plans for the acquisition and use of aerial resources to meet the federal wildland firefighting mission (Booz Allen Hamilton, 2015; GAO, 2013).

**Interagency coordination and cooperation:** The need for cross-jurisdictional coordination and collaboration has long been acknowledged as a necessity in a space as complex as wildland fire aviation management. Improving interagency coordination, reducing duplication, facilitating interoperability, and enhancing collaboration related to wildland fire response overall motivated the formation of the National Interagency Fire Center (NIFC), the National Interagency Coordinating Center (NICC), the National Wildfire Coordinating Group (NCWG), and the National Interagency Aviation Committee (NIAC) of the NCWG. These bodies bring together federal, state, Tribal, and local agencies and organizations including the National Park Service, the U.S. Forest Service, the Bureau of Land Management, the U.S. Fire Administration, the Bureau of Indian Affairs, the U.S. Fish and Wildland Service, the Intertribal Timber Council, the International Association of Fire Chiefs, and the National Association of State Foresters. The NIFC and the NICC are responsible for supporting interagency coordination and deployment of aviation resources to wildfire incidents throughout the United States. During wildfire incidents, it falls to the NICC to coordinate the mobilization of needed resources, including aviation resources, from across the country, based on requests from Geographic Area Coordination Centers. Additional national-level coordination of aviation standards, procedures, and programs is overseen by the NIAC. The NIAC brings together aviation managers from federal and state agencies to help facilitate interoperability between agencies through common policy, direction, programs, and training, with the goal of enhancing

safety, effectiveness, and efficiency of aviation operations related to wildland fire management (NIAC, 2017).

The existence of these entities notwithstanding, reviews and strategies over the past decade have urged additional multi-party cooperation in aviation strategy development. In its 2013 review, the Government Accountability Office (GAO) recommended “enhance[d] collaboration between the agencies and with stakeholders in the fire aviation community to help ensure that agency efforts to identify the number and type of firefighting aircraft they need reflect the input of all stakeholders in the fire aviation community” (GAO, 2013, p.37). In its most recent draft strategic plan, the NIAC similarly called for increased interagency collaboration to eliminate redundant federal aircraft procurement efforts, improve future procurement strategies, and make decisions on future federal aircraft fleet composition and technology enhancements to develop a safe, effective and cost-efficient aircraft fleet (NIAC, 2017).

**Aerial resource efficacy:** The call for better information on the performance of firefighting aircraft dates back to the 1960s (GAO, 2013). More recent reviews have echoed the importance of assessing aerial resource effectiveness and return on investment in order to develop sound strategies for the composition of the nation’s firefighting aircraft fleet (AFUE, 2020; Booz Allen Hamilton, 2015; RAND Corporation, 2012). Recognizing calls for increased data collection, analysis, and strategic planning, the USDA in 2012 began a “first-of-its-kind” study to assess the efficiency and effectiveness of aviation resources - the Aerial Firefighting Use and Effectiveness (AFUE) report (USDA 2020, p.6). The effort made it its mission to “systematically document the operational utilization and tactical contribution of aerial firefighting resources that have the ability to deliver water and wildland fire chemicals in support of incident objectives” (USDA, 2020, p. 8). The study undertook data collection and analysis to determine both how often aerial drops interacted with fire and how frequently these interactions met mission objectives.

The final AFUE report, which was released in 2020, did make some progress in developing the necessary information on the efficacy of aerial resources. It determined both how often aerial drops interacted with fire and how frequently these interactions met mission objectives for three groupings of aircraft: (1) helicopters and scoopers; (2) single engine airtankers (SEATs); (3) large airtankers (LATs) and very large airtankers (VLATs). The report is cross referenced by type of action, incident, and category of aircraft. However, the AFUE report also notes a number of limitations to the study design, including a sampling bias towards incidences with “substantial aircraft activity and especially those with any airtanker activity,” given the original emphasis of the study on large and very large airtankers (USDA, 2020, p. 16). Although not explicitly noted as a limitation, the study is nearly exclusively focused on aircraft use for water or retardant drops. This represents only one of the seven recognized uses identified in the 2013 USDA Forest Service Aviation Strategic Plan: 2014-2018 (USDA,

2014). Furthermore, while the report assesses effectiveness across types of aircraft, it did not include an analysis of effectiveness relative to the cost of various aircraft, making a cost benefit analysis difficult without additional study.

**Aerial resource strategy:** Historically, efforts to assess aerial fleet needs and to develop strategic plans for aviation resource management have fallen short of their goals. The GAO reported in 2013 that there had been nine major efforts to identify the number and type of needed firefighting aircraft, but those efforts were hindered by limited information and collaboration. More specifically, a common challenge was the lack of information on aircraft performance and effectiveness, primarily because federal agencies did not collect such data (GAO, 2013). As one example, a 2012 study by the RAND Corporation intended to assess the ideal composition of large aircraft for optimal returns on investment in initial attack. However, the study’s models produced “a frustratingly broad range of answers” due to what it termed “fundamental uncertainties in the science and economics of wildland firefighting” (RAND Corporation, 2012).

The NIAC’s development of the Interagency Wildland Fire Management Aviation Strategic Plan: Vision 2027 was the most recent effort to optimize and efficiently manage aerial resources. The plan was released in draft form in 2017 and its first objectives aim to “measure the use and effectiveness of aerial suppression aircraft during tactical employment” and then “utilize aircraft performance and effectiveness data in decisions concerning the future composition of the federal aircraft fleet” (NIAC, 2017, pp. 9-10). Anticipating the release of the AFUE study during the time of its development, the NIAC strategy explicitly named an intent to utilize outcome-based, best-value models from the AFUE Study as “the key fleet composition decision-support tool” (NIAC, 2017, p. 9). Other plan objectives, as noted previously in this report, include increasing interagency collaboration in arenas such as procurement and decision-making about future fleet composition. The plan also called for modernizing resource coordination and dispatch systems, improving workforce training, and bolstering the capacities and capabilities of infrastructure to meet needs of the evolving firefighting aircraft fleet.

As of 2022 however, the Vision 2027 remained in draft form and there were no plans to finalize it.<sup>3</sup> In lieu of an interagency strategy for the nation’s aviation assets, the NIAC follows a set of guiding principles. It should be noted that local, state, and federal agencies also have their own strategies and policies that provide guidance for aviation management.

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<sup>3</sup> The incomplete status of the report may be due in part to capacity challenges. NIAC members stated that their participation in the committee is an ancillary duty and therefore not a priority function.

# Findings and Recommendations

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## Aerial Equipment Strategy

### Finding 1

The Commission's primary charge within this body of work was the development of a strategy to meet aerial firefighting equipment needs through 2030 in the most cost-effective manner. The Commission discussed several factors that will influence aerial firefighting needs and approaches in the next decade. Most important and all-encompassing is the changing nature of wildfires, due in part to fuels buildup, fire exclusion, development in fire-prone areas, and climate change. The Commission found that **the current wildland fire aviation strategy is based on a seasonal model, yet fire seasons are now longer, overlap geographically in ways they previously did not, and indeed, may be full fire years [F1]**. Historically, wildfire has occurred at predictable times during the calendar year that have varied from one region of the country to another. For example, the Southeast has typically experienced fire during the winter months while the Southwest has seen fire occurrence in the summer. In the coming decades however, models show that wildfires will be larger and more extreme, fire seasons will be longer, and fire seasons in various regions of the country will increasingly overlap (National Oceanic and Atmospheric Administration [NOAA], 2022). These changing conditions necessitate a reexamination of current approaches to aerial wildland fire mitigation and management.

### Finding 2

It is also vital to note that while **aviation resources have value in managing unwanted fires, aviation actions are not the sole solution to mitigating and managing wildfire risk [F2]**. While aerial resources have unique capabilities and can be used in a variety of ways, they should not act alone. As such, planes, helicopters, and airtankers nearly always engage in tandem with ground forces, and the effectiveness of any wildland firefighting strategy depends on using ground and air resources in complementary ways.

While past studies have attempted to provide an answer as to the optimal size of the wildland fire aviation fleet (e.g., Stonesifer, 2021; Calkin, 2014), there is very likely no single answer but rather a sliding scale of options that will continue to trade costs for impact with diminishing returns. Very few studies have been able to demonstrate the relative effectiveness of different types of aviation assets and none that the Commission was aware of had definitively tied that efficacy to related costs.<sup>4</sup> This is to say nothing of a more comprehensive cost accounting

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<sup>4</sup> The USDA's 2020 AFUE report did generate some findings related to effectiveness, such as drop effectiveness of various aircraft types as determined by alignment of observed outcome with the pre-determined drop objective. However, as noted above, the

that balances resource costs with avoided costs of potential outcomes, such as loss of property and human health impacts.

Previous reviews and strategies noted the need for aircraft performance and effectiveness to form the basis for aerial fleet decision-making. The National Interagency Aviation Committee (NIAC) Vision 2027 strategic plan specifically called for decision-making about fleet composition to be informed by outcome-based, best-value modeling developed from data on the use and effectiveness of aerial suppression aircraft (NIAC, 2017). Though the Aerial Firefighting Use and Effectiveness (AFUE) report made some headway in assessing aircraft efficacy, the Commission's own investigations reinforced that development of standards and strategies based on performance data continues to be a need. At the time of the Commission's work, however, no universal standard existed to measure aerial response need and success. Without such a benchmark, there lacks a specific goal or outcome toward which an aerial equipment strategy should aim.

Finding 3

The Commission therefore finds that **the appropriate or optimal number of aircraft can only be answered after a strategic framework and national performance measures have been developed [F3]**. The current federal wildland fire strategy is known as "Total Mobility" and relies on movement of resources as needed within geographic areas and nationally, depending on risk. It is iterative and adaptive, with adjustments based on the anticipated fire season, available funds and aircraft, and expert assessment of wildland fire risk and the benefit of aviation assets. This strategy is not, however, based on empirical standards for success, efficacy, or efficiency. Indeed, it may be impossible to provide such standards with any reasonable certainty, nor did the Commission wish to imply that the current approach is inherently lacking. Rather, if Congress wants a benchmark by which to measure sufficiency, some set of predetermined standards appears to be necessary.

One such standard in use in structure firefighting is known as "Standards of Cover." A Standard of Cover (SOC) is defined in the Center for Fire Public Safety Excellence's Community Risk Assessment: Standards of Cover 6th Edition as "those written policies and procedures that establish the distribution and concentration of fixed and mobile resources of an organization" (Fagan, 2015). Put more simply, SOC "consists of decisions made regarding the placement of field resources in relation to the potential demand placed on them by the type of risk and historical needs of the community. The outcome must demonstrate that lives are saved and properties are protected" (Forest Grove Fire and Rescue,

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study had several limitations. Another 2013 report, the Analysis of Aircraft for the Fire Fighting Mission in Colorado (Conklin & de Decker Aviation Information, 2013) was relatively narrow in scope. It assessed aircraft effectiveness of four aircraft types as determined by two measures related to retardant delivery. The RAND Corporation's 2012 study attempted to assess aircraft return on investment based on cost and effectiveness for initial attack, but produced a "frustratingly large" range of answers (RAND Corporation, 2012).

2016, p.4). In the wildland fire context, a SOC might be defined as the ability to detect a wildfire, confirm a wildfire, or provide an aviation response to a fire suppression effort within a fixed period of time.

California's CAL Fire has a well-known example of an initial response-focused SOC in the wildland fire aviation arena. CAL Fire defines their standard as having sufficient resources to "reach" even the most remote area of their responsibility and jurisdiction within 20 minutes (California Department of Forestry & Fire Protection, 2022). A CAL Fire representative informed the Commission that response is defined in terms of the ability to place wildland firefighters on the scene with the use of aerial resources within the specified 20-minute time frame.

#### Recommendation 1

The Commission found that the idea of standards of cover had some merit as a general concept, but it was unwilling to support the wholesale adoption of a national SOC. Rather, **the Commission recommends the establishment of a task force comprised of a cross-representative group of fire organizations and other interested and affected parties, to explore the feasibility of a regionalized approach to Standards of Cover [R1]**. A review of the feasibility of a SOC approach could be conducted as an independent effort or as a component of one of the current and ongoing reviews of aviation strategy already underway.

One benefit of the adoption of SOC for use in wildland firefighting would be the establishment of a benchmark by which to judge resource sufficiency as measured against a pre-determined standard. Such a standard, set annually or every few years, would help provide a clear goal and the easy assessment of having met that goal. Conversely, if resources fell short of the goal in a given year, it would improve the ability to communicate resource gaps to Congress. However, it is important to note that no SOC is a perfect proxy for effective and efficient response. Rather, SOC's are a performance measure by which to document accountability, not a strategy in and of themselves.

The recommendation to consider a SOC model that is regional in nature reflects the recognition that the vast and diverse geography under federal, Tribal, state, and local jurisdiction makes it infeasible for a single SOC to suffice for the entire nation. Definitions of what actions would constitute "response" would likely need to vary, as would reasonable response times. Some areas, for example, may not benefit from a regional SOC that emphasized delivery of personnel due to wildland fire management strategy in that forest type. Even differing jurisdictional geographies, such as Wilderness Areas, may need different definitions of SOC; in those areas, the SOC may need to be driven by an observation-based response, rather than a suppression-based one. Given the seasonality of wildfire, any SOC also would need to be calibrated to current conditions related to wildfire risk, as well as geographical and operational specifics.



Furthermore, a SOC approach would need to address the fact that resource allocation decision-making structures and practices are, and must continue to be, multiagency, multijurisdictional, and cross-regional in nature. Similarly, any update or review of aviation strategy must be taken in the broad context of overall fire and land management with the recognition that aviation will continue to be only one component of wildland fire management and response. Given the complexity of developing a national strategy, it will be important that such an effort explore a time horizon beyond 2030 and build upon previous and ongoing interagency strategy efforts.

### *Coordination with Partners*

As noted previously in this report, aviation response involves high levels of complementarity and interdependence between various federal, state, and local entities that each contribute different resources and capabilities at different scales. Aircraft resources, which include helicopters and scoopers; single engine airtankers (SEATs); large airtankers (LATs) and very large airtankers (VLATs), serve a variety of functions.<sup>5</sup> Multiple types of aircraft often operate simultaneously during wildfire, with each aircraft type bringing a different suite of capabilities (GAO, 2013). In addition to manned aircraft, Uncrewed Aerial Systems can perform important aerial firefighting functions such as surveillance, monitoring, and supply drops.

While some of these aerial assets are agency-owned, the majority are owned and operated by private companies that enter into contracts with federal, state, and local agencies to deploy resources on a seasonal basis. Governments and firefighting agencies procure different portfolios of aviation assets and then enter partnerships and agreements with one another, with the military, and with other countries to ensure access to the diversity of resources needed to effectively meet suppression demand across all jurisdictions (Belval et al., 2020; GAO, 2013).

Given the highly complex, interdependent nature of aerial response, the Commission recognizes the need for development of a truly national - not federal - aviation resource strategy. Such a plan must be informed by a diversity of interested and affected parties and should work towards greater integration across agencies and implementers. Coordination and cooperation in this realm are especially important to achieve reasonable aviation coverage in the face of longer fire seasons. As is often stated as a truism, wildfire does not respect jurisdictional boundaries: a fire that starts on one land ownership may spread to

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<sup>5</sup> According to the U.S. Forest Service, aviation resources serve seven primary functions: deliver equipment and supplies; deploy smokejumpers and rappellers to a fire; transport firefighters, provide reconnaissance of new fires, fire locations, and fire behavior; provide aerial supervision of incident aircraft and coordinate with ground resources; drop fire retardant or water to slow down a fire so firefighters can contain it; and ignite prescribed fires.



Recommendation 2

any other. Likewise, development of a national aviation resource strategy should include the perspectives of all affected parties, including states, Tribal nations, and local fire response organizations. For example, the Commission heard some reluctance from state aviation managers regarding deployment of state resources beyond their jurisdictional boundaries (except in the case of neighboring state compacts). Such concerns deserve fair consideration, though successful implementation of a concept such as regional SOCs would necessitate the mitigation of these types of deployment limitations. **Efforts also should also be made to include contractor perspectives in any future strategy development given that, at this time, the majority of aviation resources in the federal fleet are owned and operated by contractors [R2].** The Commission recognizes that there are issues with real or perceived conflicts of interest in such an approach but trusts that federal agencies can find ways to both satisfy contracting requirements and still gather the valuable feedback from this sector of the wildland fire aviation community.

### *Ownership Models*

As previously mentioned, federal wildland firefighting agencies primarily procure and manage aviation resources via contracts with private companies. Approaches common with states include both the use of government-owned aircraft that are operated by contracted staff, and the procurement of privately-owned and operated contract resources. Direct government ownership of aviation resources is far less common. Because these procurement and ownership approaches have different implications for agency operations, finances, and aviation response more broadly, the Commission recommends that **a national strategy should consider all ownership models, including contracting and government ownership of aviation resources [R3].** As a part of this consideration, the Commission also recommends that a **strategic review include a cost comparison of Department of Defense (DoD), government, and private-owned aviation assets [R4]** to better understand the appropriate role of military assets in wildland firefighting.

Recommendation 3

Recommendation 4

### *Aerial Equipment Availability*

While the Commission was unable to establish the total need for aviation assets through 2030, Commission members recognized that, in the face of current wildfire trends, there is likely a need to increase the overall availability of aviation resources in the right situations. Increasing the availability of aviation assets requires consideration of overall funding, the structure of associated appropriations, contracting requirements, and bottlenecks to deployment of existing or additional resources, including staffing and infrastructure limitations, all of which are discussed in the following recommendations.

## Contracting and Appropriations

Federal agencies' reliance on contracts to provide aircraft and associated support crews has been driven in part by budgetary constraints, the nature of Congressional appropriations, and the historically seasonal nature of fire suppression needs.

Federal agencies primarily use two types of contracts: Exclusive Use (EU) and Call When Needed (CWN), though there is a new effort to adopt a third contracting structure, Multiple Award Task Order Contract (MATOC), discussed in greater detail below. EU contracts ensure aircraft availability at any time during the contract's "mandatory availability period" (MAP) and are structured with a per-day rate as well as a rate for each hour flown (GAO, 2013). CWN contracts are not guaranteed use unless the contracts are "activated" and involve compensation for only the hours flown (Belval et al., 2020; GAO, 2013). This contract type also allows the government the flexibility to pay for firefighting aircraft only when they are used, but generally involve rates which, per hour flown, are higher than other contracting models (GAO 2013).

Use of CWN and EU has fluctuated over time, but data provided by the federal agencies show that they currently use CWN contracts more frequently than EU contracts. Agency staff noted that this shift is due to multiple factors, including longer fire seasons that require more "surge" capacity that is often fulfilled through CWN contracts as well as industry protests of new contracts leading to short-term reliance on CWN. Budget structure factors are also major drivers of this trend. EU contracts can put significant strain on individual agency budgets, while CWN contracts are covered through an entirely separate suppression funding mechanism. Agencies hold EU contracts individually and the contracts require both an up-front base payment to secure an aircraft's availability and a per-hour payment if the aircraft is used. When a contract is issued as a "multi-year," it also requires agencies to obligate funding to cover a "cancellation ceiling," which is funding that must be set aside in case the agency ends the contract sooner than stipulated. The up-front costs of EU contracts and the associated cancellation ceilings amount to significant expenses, all of which must be covered by agency-specific preparedness budgets that must balance not only aviation, but all of an agency's preparedness needs on an annual basis. Further, if agencies bear the cost of an EU contract and the equipment is used by another agency, the process of getting reimbursed is complex and can take years. Conversely, CWN contract costs do not impact annual agency programmatic budgets. Instead, since the "fire funding fix" of 2018 (FY 2018 Omnibus Spending Package) CWN contract costs are billed to the specific incident that calls for them and are paid for out of a suppression fund that is separate from agencies' annual budgets. Further, these contracts do not require agencies to pay up-front contract or cancellation ceiling payments because CWN resources are only compensated for the hours they are used.

Budget structure factors also have influenced agency approaches to contract length, structure, and evaluation. For both EU and CWN contract types, agencies tend to develop contracts that cover only the months of the year that have corresponded with the historical length and timing of wildfire seasons across the country, depending on geographic region. If wildfires occur outside of those times, contracted aviation resources are less available for response. For EU contracts in particular, agencies often use contracts that have a 90-day mandatory availability base period with multiple 1-year “options” that are added sequentially, instead of multi-year EU contracts with extended availability periods. These approaches allow federal agencies to cover only the minimum costs required for a single year of aviation contracts, rather than obligate funding up front for multiple years. As noted previously, agencies are frequently unable to make multi-year funding commitments due to federal appropriations processes of allocating single-year funds that can only be used in one fiscal year. The Commission also heard that while agency procurement practices incorporate best value considerations when evaluating contracts, competitive bidding seems to return to lowest cost, which can act as a negative incentive for contractors to invest in equipment and operational performance beyond minimum requirements. Taken together, **agencies’ current budget structures and contracting constraints have incentivized the use of contracts that are seasonal, shorter term, and, while incorporating best value considerations, ultimately favor short-term budget expediency over long-term value [F4].**

Finding 4

The Commission also notes that as of early 2023, federal agencies were making changes to contracting strategy to reflect the increasing demands for services and the limited federal workforce. By using a MATOC, the government can qualify multiple vendors and their aircraft by issuing a contract with a minimum value guarantee. Then the government can issue either competitive task orders or direct orders at CWN rates depending on the circumstances. This approach intends to balance the benefits of CWN and EU while reducing the burden to the government. These contract changes were being put in place for helicopters and airtankers in 2023 and there were plans for expanded use of this model in the future. The Commission understands that agency staff are hopeful of this new approach to contracting but also heard concerns from the contracting community. It is likely too soon to know how well this approach will meet the collective need and will require future assessment.

Based on its review of aviation contracting practices, the Commission saw value in greater use of EU contracts when the model best meets need. EU contracts may provide more certainty of coverage given a longer fire season (especially if developed with longer mandatory availability periods) and also provide more certainty to contract aviation companies that constitute the overwhelming majority of the wildland fire aviation fleet. Contractors reported difficulties with federal agencies’ increasing use of CWN contracts, which do not provide stable, long-term demand. They noted that uncertainty associated with CWN contracts poses challenges for making staffing decisions and securing investments for the growth

of businesses. Industry representatives also said that shorter-term contracts, along with lowest-cost contractor selection, tend to disincentivize investments in fleet and technology upgrades that may improve safety, such as heads up displays. Finally, industry representatives noted the rise of a global market for aviation services, including in Turkey, Greece, and Spain and expressed concern that the U.S. would see a diminishment in the availability of contract aviation resources should companies be attracted to the greater certainty of international long-term contracts. While the Commission cannot validate such claims directly, it was made clear that greater use of longer-duration contracts such as EU contracts, and a standardization and improvement of contracting processes would encourage investments in safety and fleet modernization, help to support vital industry partners, and meet the needs of longer fire seasons - a point supported by some agency subject matter experts as well.

In addition to the structure of contracts, the private sector aerial firefighting industry indicated a high-level of frustration with contract process in general. In most cases there are upwards of seven different federal officials from whom sign-off is needed, with additional difficulties reported from contractors' working with state governments. The Commission acknowledges this frustration, while also noting that these bureaucratic processes are often well-intentioned and reflect legitimate efforts to ensure appropriate contract oversight.

#### Recommendation 5

Based on these factors, the Commission recommends that **contracting process should meet operational demands, including the option of reliable longer-term contracts for baseline capacity needs and every effort should be made to improve the effectiveness and efficiency of the contracting process [R5]**.

The consideration of longer-term contracts should include both multi-year contracts and contracts that extend for longer operational periods within the year. More generally, **the type of contract used should meet the needs of a national strategy rather than allowing cost considerations and established procurement policies to override programmatic needs [R6]**. Aviation operations should drive contracts and not vice versa.

#### Recommendation 6

#### Recommendation 7

Recognizing the complexity of this issue and the very real funding constraints in which the federal agencies operate, the Commission also recommends that **appropriations be commensurate with the increased length of the fire season [R7]**. This should include consideration of the time constraints of current appropriations structures (single-year rather than multi-year appropriations that could fund longer contracts) and current categories of appropriations (e.g., separating fuels mitigation and suppression, rather than providing integrated funding for those purposes). Furthermore, given the seeming disincentivizing role that cancellation ceilings play in the use of EU contracting, consideration could be given to alleviating this burden by allowing agencies to obligate funds for cancellation ceilings in economically viable stages, as was done for Stewardship End Result Contracting (P.L. 115-141). The topic of appropriations and

acquisitions regulations will also be taken up by the Commission in its full recommendations report.

## Staffing

The availability and successful deployment of aerial equipment is contingent upon crews of associated support personnel, including pilots, mechanics, base managers, aircraft crews/modules, and aircraft managers. The current personnel approach heavily relies on the use of contracted technical staff, such as pilots and mechanics to directly operate and interface with aviation resources. Agency personnel act as managers, with duties that include overseeing contractor performance and compliance and coordinating between aircraft crews and other support personnel (NWCG Position Catalog). While these agency staff hold qualifications to manage resources, many are not themselves employed in full-time aerial wildland fire response positions, but rather incident-specific “roles,” which are collateral responsibilities in addition to their regular duties and for which they do not receive differences in pay when serving in specialized roles.

Representatives from local, state, and federal agencies, as well as private contractors, reported that personnel shortages at all levels are the top challenge to maintaining and growing current aviation capacity. In recent years, staffing shortfalls have forced the closure of some air bases and state and federal agency members of NIAC made clear that they do not have sufficient program management personnel to be able to onboard and operate advanced excess DoD aircraft, though other issues also make this infeasible (NIAC, 2022). The Commission also heard that greater adoption of UASs is hindered, in part, by insufficient training and education, and shortages of dedicated, applied UAS staff positions. This lack of workforce capacity in aviation mirrors larger shortages in the wildland fire community writ large. In short, **lack of qualified personnel is a bottleneck to the use of existing resources [F5]**.

### Finding 5

### Recommendation 8

Given staffing and qualification limitations, the Commission recommends that Congress and the agencies **provide for increases in funding for greater availability of aviation training and staffing at all levels [R8]**. This should include aviation management positions, but also consideration of dedicated staffing for NIAC and additional procurement staff and training to help support aviation assets. Agencies may wish to consider partnering with community colleges, which could be well-positioned to develop and provide such training. The Commission understands that the National Wildfire Coordinating Group (NWCG) is in the process of modernizing incident position and training qualifications and hopes that this will also help address some of the need for additional qualified personnel. Other potential solutions include incentivization of additional qualifications by offering higher pay when using those skills. A more experimental approach to this issue would be to **explore the feasibility and appropriateness of allowing private contractors to provide NWCG-qualified**

### Recommendation 9

**support staff [R9]**, although conflicts of interest would need to be avoided, as would unintended consequences of losing agency staff to private contracting jobs. For example, one agency SME saw value in more centralized, nonagency preseason certification of the contractor workforce.

Recommendation 10

Finally, the Commission recommends that agencies **explore technology to increase operational effectiveness and reduce staffing demands [R10]**. This may include increased use of UAS and satellite data to monitor fire behavior. Given that staffing and workforce issues extend beyond aviation, Commission also plans to address these topics in its full recommendations report.

## Military Interoperability

Closely related to staffing shortages, the Commission heard examples of areas of inconsistency between DoD personnel certifications and qualifications and those used in the wildland fire community. A number of military positions, such as mechanics and pilots, track closely with positions associated with aerial wildfire response and receive training to maintain and operate aircraft that are similar to those used by wildland firefighting agencies. While this presents opportunities for utilizing current and former military personnel in wildland firefighting, the Commission heard that DoD certifications and trainings did not always receive recognition in the wildfire management system.<sup>6</sup> These challenges could be mitigated via two main avenues, one being improved systems for recognizing military training and experience when it is equivalent and directly transferable to wildland firefighting. For skills or positions that are similar but not directly compatible, the Commission sees an opportunity to create more streamlined training and certification systems that could be adopted by DoD as well as civilian agencies such as the U.S. Forest Service and those in Department of Interior. Specifically, the Commission recommends that an effort be made to **develop a uniform standard of training and carding certifications across DoD and land management agencies [R11]** so as to improve interoperability for personnel. This would likely require modification of current DoD training to include more wildland fire operations.

Recommendation 11

The Commission recognizes that challenges of interoperability extend to aviation assets as well. All aircraft must be certified, or “carded,” in order to participate in federal wildfire response, and the Commission heard of issues with the transferability and reciprocity of certifications and carding between state assets, federal assets, and military assets. As a result, it can be difficult to use military and state owned or contracted assets on federally managed fires. Given the

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<sup>6</sup> As one example, the Commission learned that the U.S. Forest Service requires that qualified mechanics coming from the military must have the appropriate civilian certification for 12 months before they can operate in the wildland firefighting space. Agency staff said that requirement is due in part to what they see as a need to prove DoD mechanics can function in a different operating environment with less support.



crosscutting, multiagency nature of issues of aircraft and equipment certification and carding, the Commission may return to explore this topic in further detail in the full report.

Use of military assets in wildland fire also varies by geography. The Commission was informed that private aviation resources constitute a small percentage of the wildland fire aviation fleet in Hawaii and the U.S. Pacific Territories and that military assets play a far larger role, though they have limited capabilities specific to fire suppression. The Commission thus recommends that **a national aviation strategy should acknowledge specific aviation needs outside of the continental United States in areas for which the federal government is responsible [R12]**. This is particularly true in the face of changing conditions and climate, which is bringing greater fire risk to areas including the Pacific Islands. Such aviation needs may require a higher degree of dedicated government-owned/DoD assets and support personnel. In general, the Commission recommends **continued utilization of DoD aviation assets for surge capacity after all government and private owned aviation assets have been fully utilized [R13]**.

#### Recommendation 12

#### Recommendation 13

## Military Surplus and Inventory Request

The IJJA placed particular focus on the potential for surplus aircraft and parts to support future aerial firefighting equipment needs. In order to inform the Commission's aviation strategy recommendations, the IJJA instructed the DoD and other relevant federal agencies to develop an inventory of available surplus aircraft and parts. The legislation also tasked the Commission with assessing existing authorities to "provide or sell surplus aircraft or aircraft parts to Federal, State, or local authorities for wildland firefighting use."

The Commission found that the General Services Administration's Federal Management Regulations and DoD policy establish a multi-step process for the disposal of what is termed "excess aircraft," including aircraft and aircraft parts, to civilian agencies and the private sector. Under this policy, military aircraft and aircraft parts are first assessed for internal use. They are offered for reuse to allied militaries and to internal programs. If there are no internal military interests, the property is determined to be excess property and is reported to the General Services Administration (GSA), which makes aircraft and parts available to other federal agencies. If there are no federal requests, the property becomes surplus, and GSA can donate to the State Agencies for Surplus Property (SASP) that determines eligibility for certain non-federal organizations to participate in the Federal Personal Property Surplus Donation program. If there are no SASP requests, property is made available for sales to the general public on the GSAAuctions.gov website. Disaster declarations can expedite this process and bypass federal screens.

After reviewing these surplus processes, the Commission worked with the NIAC, the DoD and the GSA to fulfill the task of developing an inventory of available surplus aircraft and parts. However, development of such an inventory proved to be difficult to accomplish for a number of reasons. Early efforts to secure an inventory from DoD resulted in a request for a list of relevant aircraft parts numbers. The Commission then approached the NIAC for assistance in better understanding this issue and opportunities to meaningfully answer the call for an inventory. In a letter dated October 18, 2022 the NIAC wrote, “It was determined that the infrastructure necessary to support the request [of an inventory] is inadequate and therefore unachievable within the given timeframe” (NIAC, 2022).<sup>7</sup>

Given the challenge associated with producing an inventory and a review of additional information on this topic, as well as the time limit set by statute, the Commission chose instead to pursue a “demand” approach to the issue of surplus by identifying needs from federal and state agencies, as well as private contractors, to inform development of a strategy. Proactively communicating desired aircraft, parts, and equipment was also named by DoD staff as a necessary step to ensuring the preservation of surplus equipment for local, state, or federal use.

The utility of military surplus was evaluated differently by the three primary consumers of military surplus – federal and state agencies, and private contractors. However, all shared some concerns regarding safety of aircraft and the process by which equipment is made available after use by DoD. High-profile, fatal accidents involving catastrophic structural failures of retired military aircraft are one cause of heightened safety concerns about the use of surplus resources. After three fatal accidents involving surplus military aircraft in 2002, a Blue Ribbon Panel was convened to identify “essential information for planning a safe and effective future aviation program” (Blue Ribbon Panel, 2002, p. i). The panel characterized the structural failures as part of a recurring problem rooted in a cycle of the U.S. Forest Service and private-sector contractors obtaining retired military aircraft and converting them for firefighting service (Blue Ribbon, 2002). Commission members similarly noted that reliance on military surplus perpetuates the cycling of older equipment into service, a practice that comes with inherent risks and fails to promote continued advancements in technology and safety.

Federal and state agency staff, as well as private contractors, shared that the required demilitarization – the removal of military hardware – and subsequent processes required to retrofit military aircraft for wildland firefighting are not only time-intensive and costly, but can be challenging due to limited interoperability, unavailability of outdated parts, and limited staff and facility capacity to do such work. Furthermore, when aircraft reach the surplus stage, it is common for parts

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<sup>7</sup> The letter is available in full in Appendix B.



and equipment to have already been removed, making them of variable utility for future use. The Commission also heard of limitations associated with search capabilities for surplus parts. Specifically, it was reported that currently, surplus parts are not contained in a master electronic parts inventory. Instead, chief mechanics or surplus officers must search for each specific part at individual Defense Logistics Agency (DLA) Disposition Services locations, of which there are dozens across the world. These search inefficiencies inhibit larger scale surplus part utilization. Additionally, the process of retrofitting must be borne by the purchasing agency and is not part of the military surplus process. Traditional contracting procedures and lack of long-term funding were named as further barriers to the effective adoption and use of DoD aircraft (NIAC, 2022). Federal agency staff did indicate an interest in mission-ready surplus aircraft, such as those that come complete with sensors suitable to use in wildland fire data collection and observation (NIAC, 2022). Given these considerations, experts have cast doubt on whether adoption of military surplus aircraft by federal agencies is a net gain to wildland fire suppression capabilities (NIAC, 2022). Private contractors offered more variable views of surplus aircraft. Some helicopter operators indicated that increased access to certain surplus aircraft would be valuable and noted the past success of obtaining certain military models, such as Huey and Blackhawk, via surplus. Some fixed wing operators, however, indicated similar safety concerns as agency staff. Agency experts also expressed concern over the reliability of surplus parts if used by private contractors. Overall, the Commission found that **adoption of military surplus aircraft by either agencies or private contractors carries risks and costs that are often overlooked [F6]**. Risks may include threats to human welfare, but also include financial and organizational risks, such as over-investment in difficult and expensive to maintain aircraft.

Finding 6

While the use of surplus military aircraft in particular comes with numerous challenges, **military surplus parts and equipment, including aircraft parts, may be beneficial to state and local wildfire agencies and the private contractor wildland fire community [F7]**. The Commission heard from state and federal agencies, as well as private contractors, expressing variable interest in surplus parts. Some state agencies expressed interest and history with seeking military surplus parts given that some local and state fire agencies rely on former military aircraft for their own fleets. Other states indicated that handling surplus parts is too time-intensive. Private contractors were more unequivocal in their interest in surplus aircraft parts. Many fly aircraft that originated as military aircraft and said they would readily make use of surplus parts should they be made more available. They specifically expressed a desire to have priority access to DoD surplus parts before that equipment is offered to foreign aviation companies, which is not the current process.

Finding 7

While acknowledging that there is variable demand for military surplus parts, and that this process comes with certain safety and risk considerations, the Commission recommends that **DoD surplus equipment and parts should be**

Recommendation 14

Recommendation 15

made more readily available to state and local wildfire agencies and the private contractor wildland fire community [R14]. This includes facilitating more streamlined transfer of equipment and parts to the appropriate agencies, after they have been made available. United States companies serving the national wildfire need should have preference over foreign companies, but consideration should be given to not place them in competition with states or federal agencies seeking surplus. Furthermore, the Commission recommends that **a list of desired DoD surplus parts from the wildland fire contractor community and state and local agencies should be developed annually to facilitate the surplus process and avoid unintentional destruction of desired parts [R15]**. Given reports to the Commission that some DoD surplus equipment has been destroyed rather than entering the surplus inventory, greater awareness of demand may add to the total available surplus equipment and thus not pit contractors against states or others in the wildland fire community.

Recommendation 16

Finally, given safety concerns with the use of military surplus aircraft and with a desire to develop a forward-looking aviation equipment strategy, the Commission recommends that **Congress should commission a study to evaluate the feasibility of developing more purpose-built or modified aircraft for use in wildland fire [R16]**. Existing interagency bodies such as the Wildland Fire Leadership Council (WFLC) and the NIAC could be well-positioned to conduct such a study. At present, few aircraft models have been purpose-built for aerial firefighting. Instead, the majority of aircraft are former commercial and former military passenger, cargo, and utility aircraft, as well as agricultural aircraft that have been reconfigured for wildland firefighting missions (NIAC, 2017). In the early history of aerial resource use in wildland fire, the military surplus process was a more significant mechanism used by local, state, and federal agencies to obtain aircraft for wildland firefighting (Blue Ribbon, 2002). Over the decades, various models of military bombers, transports, helicopters, and patrol aircraft were rotated into the nation's wildland firefighting fleet (Blue Ribbon, 2002). This has shifted over time, however, with an increased use of modified commercial aircraft in the last few decades with the current fleet having limited military surplus in the inventory, presumably in response to the 2002 Blue Ribbon investigation.

In its report, the Blue Ribbon Panel aptly noted that wildland firefighting involves a unique set of conditions and challenges. As the size and severity of wildland fires continues to grow, the Commission's recommendation intends to underscore the need for increased innovation and the use of newer, specialized technology to ensure aerial assets are designed and equipped to operate safely and effectively in this environment. The Commission also acknowledges several cost-related considerations associated with this recommendation. For one, the wildland fire constitutes a relatively small sector of the overall aircraft market and therefore may not carry sufficient weight to attract significant interest in developing purpose-built aircraft. However, the Commission also heard that in some circumstances, purpose-built equipment may be more cost-effective than

retrofitting surplus equipment. Additionally, to encourage investments by the private sector in this realm, there will likely be a need to pursue contracting mechanisms that provide longer-term certainty.

Given these considerations, modifications to commercial aircraft may constitute a middle ground between fully purpose-built and surplus, though the need remains to assure that the aircraft used in support of wildfire management meet the needs of this uniquely challenging environment. The development of purpose-built or modified aircraft also should be informed by overall strategic need, as has been addressed in other areas of this report. Finally, given that there are significant costs associated with purpose-built and modified aircraft, this task should be pursued with an eye toward ensuring any final product is not cost prohibitive for agencies to acquire, or that appropriations are modified to enable aircraft acquisition.

## Aerial Resources and Beneficial Fire

Climate change-driven increases in the length and severity of fire seasons, along with surging development in fire-prone areas, and unnaturally high fuel accumulations in fire-adapted landscapes necessitate a scaling up of proactive wildfire mitigation activities, including prescribed fire. While this pressing issue will receive more complete attention in the Commission's full report, the need to implement more prescribed fire projects to reduce wildfire risk will likely put new demands on aviation resources to support mitigation activities year-round, and will require new models of aviation staffing and management.

Aerial resources may be used to support the use of proactive, beneficial fire like prescribed fire, both through assisting with aerial ignitions and by being on hand to respond to contingencies or undesired outcomes. However, the Commission heard that cost and availability make it difficult for agencies to access aviation resources for these project-related (rather than response-related) purposes. For example, when used for project activities not associated with wildfire response, some aviation costs must be charged to agencies' general program budgets, which are often strained by a number of needs and priorities. For most entities, this fact makes aviation resources cost prohibitive. As an additional challenge, Commission members shared that aerial assets are often unavailable during prescribed burn windows, either because those burns happen outside the terms of seasonal contracts or because resources are occupied on wildland fires in one region when other regions have opportunities to proactively burn. **In sum, greater use of beneficial fire is currently limited, in part, by overall aviation capacity and available funding. Improved aviation availability and capacity may help allow for more proactive management options in addition to providing contingency resources [F8].** As such, the Commission recommends that Congress and agencies **ensure greater availability of aviation resources for risk mitigation projects, including prescribed fire [R17].**

Finding 8

Recommendation 17

## Uncrewed Aerial Systems

Uncrewed Aerial Systems (UAS) technology is seen as a promising advancement in wildland fire mitigation and management, but both federal statute and agency policy hinder the use and acquisition of this equipment. Section 848 of the National Defense Authorization Act (NDAA) prohibits the federal use or acquisition of drones or critical components of drones manufactured in China (Public Law 116-92). The DoD has established what is known as a “Blue List” of technology that is in compliance with the NDAA, however, SMEs informed the Commission that Blue List UAS were significantly more expensive and had lower operational value than readily available “off the shelf” commercial technology. This restriction can limit acquisitions options for federal agencies and present problems if states are invested heavily in Chinese-manufactured drones as they may have their assets sidelined if a fire is federalized and thus subject to NDAA compliance (Colorado Center of Excellence for Advanced Technology Aerial Firefighting, 2022). In the same vein, the Commission heard that lack of domestic manufacturers is hindering greater adoption of UAS technology among some federal agencies, and that additional investment in this arena would be valuable.<sup>8</sup>

### Recommendation 18

While issues of national security are clearly important and require careful consideration, the Commission recommends **improvement in the availability of drone technology for use in wildland fire [R18]**. Emerging development and integration of UAS technology is a significant operational innovation in wildland fire (NIAC, 2017) and is seen by some as potentially replacing or complementing use of manned aviation resources for activities such as sensing and monitoring. Indeed, the NIAC Vision 2027 strategic plan notes that UAS “may be the first aviation-associated operational innovation for wildland fire management operations in almost fifty years” (NIAC, 2017). UAS technology can, and should, be more robustly utilized overall in the aerial wildland fire space. In addition to needs associated with the overall availability of UAS technology, the Commission was informed that at this time, the wildland fire community lacks a national strategy for integration of this technology. Given this status, the Commission recommends that agencies **develop a national UAS strategy for wildland fire [R19]**.

### Recommendation 19

Greater use of UAS in wildfire management is only one specific example of the promise of greater adoption and modernization of technology for use in wildfire management. Remote sensing and satellites, predictive modeling, and improved

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<sup>8</sup> For example, agency staff noted that it would be particularly useful for Congress to incentivize domestic manufacturers to produce drones capable of carrying 200 to 500 pounds, which are needed for not only wildland fire uses, but other governmental needs including the military.

data collection and management are all important technological issues that the Commission plans to address in more detail in the full report.

## Conclusion

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The questions asked of the Commission, and the issues that these recommendations address, are both complex and exceptionally important to the future success of aerial wildland firefighting. Throughout this report, the Commission has underscored several themes: the need to develop an overarching, forward-looking aviation strategy that drives procurement, rather than letting aviation approaches become constrained by current practices; the need to invest in both technology and people to build an aviation fleet that meets long-term demand; and the need to take an inclusive approach to the range of functions aerial resources can serve and the range of entities that must be included in development of a truly national – rather than federal – aviation strategy. The Commission also would emphasize that it does not intend to create unfunded mandates with the recommendations it presents and will address the broader issue of funding for wildfire programs and issues in its subsequent recommendations. In addition to funding, there are a number of topics that relate to, but go beyond solely aviation that the Commission plans to take up in its full report to Congress. The Commission urges interested parties to reference that report, scheduled for completion in September 2023, for additional recommendations that will build upon the work presented in this document.

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# Appendix A: Enabling Legislation

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## TITLE II—WILDFIRE MITIGATION

### SEC. 70201. SHORT TITLE.

This title may be cited as the “Wildland Fire Mitigation and Management Commission Act of 2021”.

### SEC. 70202. DEFINITIONS.

In this title:

- (1) APPROPRIATE COMMITTEES OF CONGRESS.—The term “appropriate committees of Congress” means—
- (A) the Committee on Energy and Natural Resources of the Senate;
  - (B) the Committee on Agriculture, Nutrition, and Forestry of the Senate;
  - (C) the Committee on Homeland Security and Governmental Affairs of the Senate;
  - (D) the Committee on Appropriations of the Senate;
  - (E) the Committee on Environment and Public Works of the Senate;
  - (F) the Committee on Natural Resources of the House of Representatives;
  - (G) the Committee on Agriculture of the House of Representatives;
  - (H) the Committee on Homeland Security of the House of Representatives;
  - (I) the Committee on Appropriations of the House of Representatives;
  - (J) the Committee on Ways and Means of the House of Representatives; and
  - (K) the Committee on Natural Resources of the House of Representatives.
- (2) COMMISSION.—The term “Commission” means the commission established under section 70203(a).



(3) HIGH-RISK INDIAN TRIBAL GOVERNMENT.—The term “high-risk Indian tribal government” means an Indian tribal government, during not fewer than 4 of the 5 years preceding the date of enactment of this Act—

(A) that received fire management assistance under section 420 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5187); or

(B) land of which included an area for which the President declared a major disaster for fire in accordance with section 401 of that Act (42 U.S.C. 5170).

(4) HIGH-RISK STATE.—The term “high-risk State” means a State that, during not fewer than 4 of the 5 years preceding the date of enactment of this Act—

(A) received fire management assistance under section 420 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5187); or

(B) included an area for which the President declared a major disaster for fire in accordance with section 401 of that Act (42 U.S.C. 5170).

(5) INDIAN TRIBAL GOVERNMENT.—The term “Indian tribal government” has the meaning given the term in section 102 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5122).

(6) SECRETARIES.—The term “Secretaries” means—

(A) the Secretary of the Interior;

(B) the Secretary of Agriculture; and

(C) the Secretary of Homeland Security, acting through the Administrator of the Federal Emergency Management Agency.

(7) STATE.—The term “State” has the meaning given the term in section 102 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5122).

(8) WILDLAND-URBAN INTERFACE.—The term “wildland- urban interface” has the meaning given the term in section H. R. 3684—824 101 of the Healthy Forests Restoration Act of 2003 (16 U.S.C.6511).

## **SEC. 70203. ESTABLISHMENT OF COMMISSION.**

(a) ESTABLISHMENT.—Not later than 30 days after the date of enactment of this Act, the Secretaries shall jointly establish commission to study and make recommendations to improve Federal policies relating to—

(1) the prevention, mitigation, suppression, and management of wildland fires in the United States; and

(2) the rehabilitation of land in the United States devastated by wildland fires.

(b) MEMBERSHIP.—

(1) COMPOSITION.—The Commission shall be composed of—

(A) each of the Secretaries (or designees), who shall jointly serve as the co-chairpersons of the Commission;

(B) 9 representatives of Federal departments or agencies, to be appointed by the Secretaries, including—

(i) not fewer than 1 representative from each of—

(I) the Bureau of Land Management;

(II) the National Park Service;

(III) the Bureau of Indian Affairs;

(IV) the United States Fish and Wildlife Service; and

(V) the Forest Service;

(ii) a representative of or liaison to the Mitigation Framework Leadership Group of the Federal Emergency Management Agency;

(iii) a representative to the National Interagency Coordination Center, which is part of the National Wildfire Coordination Group;

(iv) a representative from 1 of the coordinating agencies of the Recovery Support Function Leadership Group; and

(v) if the Secretaries determine it to be appropriate, a representative of any other Federal department or agency, such as the Department of Energy, the Environmental Protection Agency, or the Department of Defense; and

(C) 18 non-Federal stakeholders with expertise in wildland fire preparedness, mitigation, suppression, or management, who collectively have a combination of backgrounds, experiences, and viewpoints and are representative of rural, urban, and suburban areas, to be appointed by the Secretaries, including—

(i) not fewer than 1 State hazard mitigation officer of a high-risk State (or a designee);

(ii) with preference given to representatives from high-risk States and high-risk Indian tribal governments, not fewer than 1 representative from each of—

(I) a State department of natural resources, forestry, or agriculture or a similar State agency;

(II) a State department of energy or a similar State agency;

(III) a county government, with preference given to counties at least a portion of which is in the wildland-urban interface; and

(IV) a municipal government, with preference given to municipalities at least a portion of which is in the wildland-urban interface;

(iii) with preference given to representatives from high-risk States and high-risk Indian tribal governments, not fewer than 1 representative from each of—

(I) the public utility industry;

(II) the property development industry;

(III) Indian tribal governments;

(IV) wildland firefighters; and

(V) an organization—

(aa) described in section 501(c)(3) of the Internal Revenue Code of 1986 and exempt from taxation under section 501(a) of that Code; and

(bb) with expertise in forest management and environmental conservation;

(iv) not greater than 2 other appropriate non-Federal stakeholders, which may include the private sector; and

(v) any other appropriate non-Federal stakeholders, which may include the private sector, with preference given to non-Federal stakeholders from high-risk States and high-risk Indian tribal governments.

(2) STATE LIMITATION.—Each member of the Commission appointed under clauses (i) and (ii) of paragraph (1)(C) shall represent a different State.

(3) DATE.—The appointments of the members of the Commission shall be made not later than 60 days after the date of enactment of this Act.

(c) PERIOD OF APPOINTMENT; VACANCIES.—

(1) IN GENERAL.—A member of the Commission shall be appointed for the life of the Commission.

(2) VACANCIES.—A vacancy in the Commission—

(A) shall not affect the powers of the Commission; and

(B) shall be filled in the same manner as the original appointment.

(d) MEETINGS.— (1) INITIAL MEETING.—Not later than 30 days after the date on which all members of the Commission have been appointed, the Commission shall hold the first meeting of the Commission.

(2) FREQUENCY.—The Commission shall meet not less frequently than once every 30 days.

(3) TYPE.—The Commission may hold meetings, and a member of the Commission may participate in a meeting, remotely through teleconference, video conference, or similar means.

(4) QUORUM.—A majority of the members of the Commission shall constitute a quorum, but a lesser number of members may hold hearings.

**SEC. 70204. DUTIES OF COMMISSION.**

(a) REPORT ON RECOMMENDATIONS TO MITIGATE AND MANAGE WILDLAND FIRES.—

(1) IN GENERAL.—Not later than 1 year after the date of the first meeting of the Commission, the Commission shall submit to the appropriate committees of Congress a report describing recommendations to prevent, mitigate, suppress, and manage wildland fires, including—

(A) policy recommendations, including recommendations—

(i) to maximize the protection of human life, community water supplies, homes, and other essential structures, which may include recommendations to expand the use of initial attack strategies;

(ii) to facilitate efficient short- and long-term forest management in residential and nonresidential at-risk areas, which may include a review of community wild- fire protection plans;

(iii) to manage the wildland-urban interface;

(iv) to manage utility corridors;

(v) to rehabilitate land devastated by wildland fire; and

(vi) to improve the capacity of the Secretary of Agriculture and the Secretary of the Interior to conduct hazardous fuels reduction projects;

(B) policy recommendations described in subparagraph

(A) with respect to any recommendations for—

(i) categorical exclusions from the requirement to prepare an environmental impact statement or analysis under the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.); or

(ii) additional staffing or resources that may be necessary to more expeditiously prepare an environmental impact statement or analysis under that Act;

(C) policy recommendations for modernizing and expanding the use of technology, including satellite technology, remote sensing, unmanned aircraft systems, and any other type of emerging technology, to prevent, mitigate, suppress, and manage wildland fires, including any recommendations with respect to—

(i) the implementation of section 1114 of the John D. Dingell, Jr. Conservation, Management, and Recreation Act (43 U.S.C. 1748b-1); or

(ii) improving early wildland fire detection;

(D) an assessment of Federal spending on wildland fire-related disaster management, including—

(i) a description and assessment of Federal grant programs for States and units of local government for pre- and post-wildland fire disaster mitigation and recovery, including—

(I) the amount of funding provided under each program;

(II) the effectiveness of each program with respect to long-term forest management and maintenance; and

(III) recommendations to improve the effectiveness of each program, including with respect to—

(aa) the conditions on the use of funds received under the program; and

(bb) the extent to which additional funds are necessary for the program;

(ii) an evaluation, including recommendations to improve the effectiveness in mitigating wildland fires, which may include authorizing prescribed fires, of—

(I) the Building Resilient Infrastructure and Communities program under section 203 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5133);

(II) the Pre-Disaster Mitigation program under that section (42 U.S.C. 5133);

(III) the Hazard Mitigation Grant Program under section 404 of that Act (42 U.S.C. 5170c);

(IV) Hazard Mitigation Grant Program post-fire assistance under sections 404 and 420 of that Act (42 U.S.C. 5170c, 5187); and

(V) such other programs as the Commission determines to be appropriate;

(iii) an assessment of the definition of “small impoverished community” under section 203(a) of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5133(a)), specifically—

(I) the exclusion of the percentage of land owned by an entity other than a State or unit of local government; and

(II) any related economic impact of that exclusion; and

(iv) recommendations for Federal budgeting for wildland fires and post-wildfire recovery;

(E) any recommendations for matters under subparagraph (A), (B), (C), or (D) specific to—

(i) forest type, vegetation type, or forest and vegetation type; or

(ii) State land, Tribal land, or private land;

(F)(i) a review of the national strategy described in the report entitled “The National Strategy: The Final Phase in the Development of the National Cohesive Wildland Fire Management Strategy” and dated April 2014; and

(ii) any recommendations for changes to that national strategy to improve its effectiveness; and

(G)(i) an evaluation of coordination of response to, and suppression of, wildfires occurring on Federal, Tribal, State, and local land among Federal, Tribal, State, and local agencies with jurisdiction over that land; and

(ii) any recommendations to improve the coordination described in clause (i).

(2) SPECIFIC POLICY RECOMMENDATIONS.—To the maximum extent practicable, the report described in paragraph (1) shall include detailed short- and long-term policy recommendations, including any recommendations for Federal legislation.

(3) INTERIM REPORTS.—Before the submission of the report under paragraph (1), on approval of all members of the Commission, the Commission may submit to the appropriate committees of Congress 1 or more interim reports, as the Commission determines to be appropriate, relating to any matters described in paragraph (1).

(b) REPORT ON AERIAL WILDLAND FIREFIGHTING EQUIPMENT STRATEGY AND INVENTORY ASSESSMENT.—

(1) SUBMISSION OF INVENTORY TO THE COMMISSION.—Not later than 45 days after the date on which the Commission holds the first meeting of the Commission, the Secretary of Defense and the heads of other relevant Federal departments and agencies shall submit to the Commission an inventory of surplus cargo and passenger aircraft and excess common- use aircraft parts that may be used for wildland firefighting purposes, excluding any aircraft or aircraft parts that are—

(A) reasonably anticipated to be necessary for military operations, readiness, or fleet management in the future; or

(B) already obligated for purposes other than fighting wildland fires.

(2) SUBMISSION OF REPORT TO CONGRESS.—Not later than 90 days after the date on which the Commission receives the inventory described in paragraph (1), the Commission shall submit to the appropriate committees of Congress a report outlining a strategy to meet aerial firefighting equipment needs through 2030 in the most cost-effective manner, including—

(A) an assessment of the expected number of aircraft and aircraft parts needed to fight wildland fires through 2030;

(B) an assessment of existing authorities of the Secretary of Defense and the heads of other relevant Federal departments and agencies to provide or sell surplus aircraft or aircraft parts to Federal, State, or local authorities for wildland firefighting use, including—

(i) a description of the current use of each existing authority; and

(ii) a description of any additional authorities that are needed for the Secretary of Defense and the heads of other relevant Federal departments and agencies to provide or sell surplus aircraft or aircraft parts to Federal, State, or local authorities for wildland firefighting use; and

(C) recommendations to ensure the availability of aircraft and aircraft parts that the Commission expects will be necessary to fight wildland fires through 2030 in the most cost-effective manner.

(3) **CONSIDERATIONS FOR ACCESSING AIRCRAFT AND AIRCRAFT PARTS.**—In developing the strategy in the report required under paragraph (2) and the recommendations under paragraph (2)(C), the Commission shall consider all private and public sector options for accessing necessary aircraft and aircraft parts, including procurement, contracting, retrofitting, and public-private partnerships.

(4) **UNCLASSIFIED REPORT.**—The inventory and report submitted under paragraphs (1) and (2), respectively—

(A) shall be unclassified; but

(B) may include a classified annex.

(c) **MAJORITY REQUIREMENT.**—Not less than 2/3 of the members of the Commission shall approve the recommendations contained in each report submitted under subsection (a) or (b)(2).

## **SEC. 70205. POWERS OF COMMISSION.**

(a) **HEARINGS.**—The Commission may hold such hearings, sit and act at such times and places, take such testimony, and receive such evidence as the Commission considers advisable to carry out this title.

(b) **INFORMATION FROM FEDERAL AGENCIES.**—

(1) **IN GENERAL.**—The Commission may secure directly from a Federal department or agency such information as the Commission considers necessary to carry out this title.

(2) **FURNISHING INFORMATION.**—On request of the Chairpersons of the Commission, the head of the department or agency shall furnish the information to the Commission.

(c) **POSTAL SERVICES.**—The Commission may use the United States mails in the same manner and under the same conditions as other departments and agencies of the Federal Government.

(d) **GIFTS.**—The Commission may accept, use, and dispose of such gifts or donations of services or property as the Commission considers necessary to carry out this title.



## **SEC. 70206. COMMISSION PERSONNEL MATTERS.**

- (a) NO COMPENSATION.—A member of the Commission shall serve without compensation.
- (b) TRAVEL EXPENSES.—A member of the Commission shall be allowed travel expenses, including per diem in lieu of subsistence, at rates authorized for employees of agencies under subchapter I of chapter 57 of title 5, United States Code, while away from their homes or regular places of business in the performance of services for the Commission.
- (c) STAFF.—
- (1) IN GENERAL.—The Chairpersons of the Commission may, without regard to the civil service laws (including regulations), appoint and terminate an executive director and such other additional personnel as may be necessary to enable the Commission to perform its duties, except that the employment of an executive director shall be subject to confirmation by the Commission.
- (2) COMPENSATION.—The Chairpersons of the Commission may fix the compensation of the executive director and other personnel without regard to chapter 51 and subchapter III of chapter 53 of title 5, United States Code, relating to classification of positions and General Schedule pay rates, except that the rate of pay for the executive director and other personnel may not exceed the rate payable for level V of the Executive Schedule under section 5316 of that title.
- (d) DETAIL OF GOVERNMENT EMPLOYEES.—A Federal Government employee may be detailed to the Commission without reimbursement, and such detail shall be without interruption or loss of civil service status or privilege.
- (e) PROCUREMENT OF TEMPORARY AND INTERMITTENT SERVICES.—The Chairpersons of the Commission may procure temporary and intermittent services under section 3109(b) of title 5, United States Code, at rates for individuals that do not exceed the daily equivalent of the annual rate of basic pay prescribed for level V of the Executive Schedule under section 5316 of that title.

## **SEC. 70207. TERMINATION OF COMMISSION.**

The Commission shall terminate on the date that is 180 days after the date on which the Commission has submitted the reports under subsections (a) and (b) of section 70204.

# Appendix B: NIAC Response to Aerial Equipment Needs and Strategies

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## National Wildfire Coordinating Group National Interagency Aviation Committee

NIAC-22-07

**Date:** 20 October 2022

**To:** Shane McDonald, Chair, National Wildfire Coordinating Group

**From:** John Buehler, Chair, National Interagency Aviation Committee

**Subject:** Issue Statement – NIAC response to Wildland Fire Mitigation and Management Commission regarding aerial equipment needs and strategies to meet those needs through 2030.

**Purpose:** The purpose of this memorandum is to communicate the National Interagency Aviation Committee's (NIAC) position on the ability to integrate identified optimum inventory of Department of Defense (DOD) sourced aerial vehicles and parts to member agencies inventory for wildland fire use. Specifically, this document examines the effort agencies would need to take to demilitarize aviation assets to meet mission capability requirements and become fully functional aviation platforms.

**Issue Statement:** To gather information in support of the purpose, fire and aviation officials met with the Department of Defense (DOD) and General Services Administration (GSA) to discuss the feasibility of obtaining an inventory of excess DOD aircraft within the desired 45-day timeline. It was determined that the infrastructure necessary to support the request is inadequate and therefore unachievable within the given timeframe. Federal and state agencies, as represented by the National Interagency Aviation Committee (NIAC), routinely pursue advancement in wildland fire aircraft and operational effectiveness through collaboration with industry and the use of contracted aviation services. Historically, the onboarding of excess military aircraft has been challenging, often leading to the depletion of significant personnel resources without appreciable gain or noteworthy impact to wildland fire suppression. Several program areas must be considered prior to the acquisition of military surplus property. NIAC members have identified these areas as funding and long-range budgets, personnel and staffing, aviation facilities, aircraft modification support, legacy aircraft, and mission-ready excess DOD aircraft.

*Funding and long-range budgets* are critical to advancement in wildland fire aviation. They offer the stability and structure needed to support the personnel, facilities, and advanced aircraft necessary for the successful onboarding of advanced DOD excess aircraft.

*Personnel and staffing* shortages hinder wildland fire operations. Wildland fire incident management teams (IMTs) are continually challenged with the lack of qualified personnel and are unable to fill aviation management positions at all levels. Pilot and maintenance personnel shortages are at record highs, with demand continuing to increase. Wages are not competitive with commercial air carrier compensation, resulting in a shortage of pilots and mechanics within the wildland fire aviation workforce. Agencies lack sufficient program management personnel to onboard and operate advanced DOD aircraft. Prior to obtaining excess DOD aircraft, agencies must receive funding and support to boost the training and qualifications of aviation and program managers as well as obtain an escalation in compensation and recruitment incentives for pilots and mechanics.

*Aviation Facilities* are inadequate for the maintenance and operation of advanced excess DOD aircraft. In most cases, facilities have not kept pace with aviation industry or DOD standards. Without sufficient facilities to operate or maintain excess DOD aircraft, the onboarding and operation will not be successful. Prior to acquisition, agencies must receive funding support for the facilities and infrastructure needed to maintain and operate excess DOD aircraft.

*Aircraft modification support* will be fundamental to the onboarding and operation of excess DOD aircraft. Historically, excess DOD aircraft have required significant modification to become mission ready to operate in support of wildland fire. Accomplishing these modifications through traditional contract actions is burdensome and the result is often an expensive, untimely, and ineffective solution. Prior to acquisition, agencies must gain the authority and support for broad, full, and agile contracting. This will allow development of modern solutions and management of the complexities associated with preparing excess DOD aircraft for the wildland fire missions.

Legacy aircraft within DOD's inventory should not be considered for transfer to NIAC member agencies. Historically, these aircraft are often outdated and unsupported by the original manufacturer. Thus, they have not remained in airworthy condition and are not suitable for long-term use in the wildland fire environment.

*Mission-ready excess DOD aircraft*, equipped to support wildland fire operations without modification or retrofit should be considered for transfer to NIAC member agencies (e.g., DOD aircraft equipped with sensors suitable for wildland fire data collection, observation, and surveillance). NIAC member agencies are unable to forecast the availability and effectiveness of mission ready excess DOD aircraft without an inventory of available aircraft.

**Background and Coordination:** This issue has been discussed at weekly NIAC meetings throughout October 2022, and all NIAC members agree that it is in the best interest of interagency aviation operations to explore all available methods to acquire and maintain aircraft for wildland fire operations.

**Contact Information:** John Buehler, Chair, National Interagency Aviation Committee, [john-buehler@nps.gov](mailto:john-buehler@nps.gov) or 208-387-5227

# Appendix C: Commission Staff

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The Wildfire Mitigation and Management Commission was supported by a staff team working under a USDA Forest Service contract with Management and Engineering Technologies International (METI), Inc. (Contract Order No. 12318722F0358).

**Tyson Bertone-Riggs**

Coordinator

**Kevin Bryan**

Facilitator

**Emery Cowan**

Technical writer

**Jen Mair**

Facilitation support

**Robin Roberts**

Facilitator

**Annie Schmidt**

Coordinator